REMARKS

Claims 2-5, 7-13, 17-20, and 22-28 are pending in the present application. Reconsideration of the claims is respectfully requested.

I. 35 U.S.C. § 102, Anticipation

The examiner has rejected claims 7-13 and 22-27 under 35 U.S.C. § 102(e) as being clearly anticipated by Hughes et al., patent number 5,920,261.

With regard to claims 7-13 and 22-27, the Office Action states:

> Hughes et al. teaches determining data relationships including determining (identifying) locations of products (see at least col.1, lines 40-50, Col. 2, lines 5-10, col. 6, lines 1-60, col. 13, lines 25-55, col. 15, lines 15-50), recording (identifying) paths of customers (see at least col. 18, lines 15-17, 35-40, col. 15, lines 15-50), associating the locations of products with the paths of customers as claimed (see at least col. 16, line 40- col. 17 line 50, col. 18, lines 19-23, col. 20, lines 10-15, 25-65) which employs data mining algorithms to generate input data for forming the set of spatial relationships (see at least col. 17, lines 5-20, 30-45, col. 20, lines 10-15, 25-60) and spatial analysis algorithms to from the set of spatial relationships (see at least col. 20, lines 40-50, col. 19, lines 1-35, col. 13, lines 25-45, col. 18, lines 15-40).

II. 35 U.S.C. § 103, Obviousness

The examiner has rejected claims 2-5, 17-20 under 35 U.S.C. § 103(a) as being unpatentable over Hughes et al., patent number 5,920,261 in view of Abell, WO 98/38589. This rejection is respectfully traversed.

With regard to claims 2-5, 17-20, the Office Action states:

> Hughes substantially teaches the invention as shown above, but does not teach identifying customers within a retail space. Abell teaches identifying customers within a retail space (see at least pp. 3-6, 9-10,21). It would have been obvious to one having ordinary skill in the art at the time of the invention to have used the customer identification of Abell in the system of Hughes since the customer identification would have aided in the floor plan of items of Hughes to plan the location of items in the store based upon the customers or class of customer who is most likely to see an item as suggested by Abell.

. . .

Applicant's arguments filed on 6/11/02 have been fully considered but they are not persuasive. The applicant argues that Hughes does not teach data mining algorithms to generate input data for forming the set of spatial relationships in col. 17 since it does not include the use of customer patterns within the store. However, the passages in col. 17 do meet this claim limitation since customer patterns are included in terms of traffic area (see also col. 20, lines 10-40) which include customer paths. In this case, data mining tools are used to measure and analyzed facility performance by associating the object location to traffic (path) data.

The passages of the present specification cited by the applicant are not persuasive to the arguments concerning the differences between the application and the applied art. The first passage listed on p. 9 is an introductory statement concerning the relationship of the placement of products and the customers. The second passage states that data mining algorithms are used to generate input data for forming a set of product and customer relationships (where it is not clear that this is the same as forming a set of spatial relationships). Further, Hughes teaches the products chosen for purchase by the customers are identified and the locations of the products are associated with the paths to form a set of spatial relationships (see at least col. 17, lines 34-36, col. 18, lines 20-23, col. 20, lines 25-30). The third passage does not relate customer paths to product location. None of the passages listed provide a specific algorithm. The claims, then, include any type of data mining method to associate the paths to the location of products. As shown above and giving the broadest reasonable interpretation to the claims, Hughes teaches data mining to associate the paths or customers to the location of products to observe buying patterns and facility performance.

III. ANALYSIS

In rejecting Claims 7-13, and 22-27, the Examiner cites Hughes et al. This reference appears to describe a system for tracking objects, but does not mention employing data mining algorithms to generate input data for forming the set of spatial relationships, as claimed in Claims 9 and 24.

Claim 9 is reproduced below, for reference:

9. A method for determining data relationships of data associated with product placement in a retail space, the method comprising the computer-implemented steps of:

identifying patterns of customers in the retail space;

identifying locations of products within the retail space; and

associating the patterns of customers with the locations of products to form a set of spatial relationships; and

employing data mining algorithms to generate input data for forming the set of spatial relationships.

This claim includes a limitation of, "employing data mining algorithms to generate input data for forming the set of spatial relationships."

The Examiner cites col. 16, ll. 40-col.17, ll. 50. These paragraphs appear to teach measuring and analyzing overall facility performance with, among other things, "mining tools." A relevant passage states:

> The Analyst tool offers users a variety of advanced data visualization, decision making and mining tools for measuring and analyzing overall facility performance. It allows a manager to quickly see which parts, for example, in retail, which departments of a store are performing well and which are not with respect to a variety of performance measures. These measures could include total profit, profit per area, and so on. The analyst tool also offers users a variety of advanced data visualization, decision making, and mining tools for measuring and analyzing micro-level data, for example, SKU (stock keeping units), colors, patterns, and styles and for analyzing overall enterprise performance. It allows a centralized manager to quickly see how stores are performing within a particular region." [Col. 17, ll. 6-19.]

Other applications of these software tools are also mentioned:

> In a first application the system provides a method for associating a value (e.g., an economic or safety value) to space. In other words, it provides a method for assigning a value to an object based solely on its location in space. This is made possible by cross relating object location data to other data (e.g., mapping 3DPOS data to a POS data set). For example, in predicting the potential profitability of particular merchandise items in a store, one would consider where the items were located and assign a location value to the items in each location, since it is known

that items placed in a high traffic area would have a greater chance of being sold as opposed to items placed in a low traffic area. [Col. 17, ll. 31-42.]

These passages mention the use of mining tools for measuring and analyzing overall system performance, but do not appear to mention, suggest, or otherwise teach the use of data mining to provide input data for forming a set of spatial relationships, as claimed by at least Claim 9.

The examples used in the above passages of Hughes include measuring and analyzing overall facility performance, total profit, profit per area, monitoring SKU of objects, color, patterns, and styles, and for analyzing overall enterprise performance. The cited reference Hughes teaches only that mining tools can be used, "for measuring and analyzing overall facility performance," [col. 17, lines 7-8] and, "for measuring and analyzing micro-level data," [col. 17, lines 14-15]. The specific employment of data mining to achieve these ends is not mentioned in the cited passages, and Applicant does not find any other mention of data mining use in the cited reference. If Applicant has overlooked a relevant teaching, it is respectfully requested that such teaching be pointed out with particularity.

The relevance to data mining in the context of the present application is demonstrated by the following passages from the application.

> "Businesses constantly desire a better understanding of a customer's buying habits in a retail establishment, and data mining has been used in an attempt to discover relationships between customers and purchases. One class of relationships for which a business desires guidance is the relationship between product placement and the choice of products for purchases by the customers of the business, which may own several databases from which such relationships could be extracted if the proper methodologies could be applied. However, data mining analysis heretofore has been concerned primarily with relationships between customer characteristics and product characteristics and not the relationships between customers and the placement of products within a retail environment." [p. 2, l. 20-p.3, l. 2.]

> "The products chosen for purchase by the customers are identified, and the locations of the chosen products within the retail space are associated with the paths of the customers through the retail space to form a set of spatial relationships. Data mining algorithms are used to generate input data for forming a set of product and customer relationships. The spatial analysis techniques of

GIS, combined with the location technologies of GPS, LPS, and EGPS, are used to formulate and capture the set of spatial relationships." [p. 4, ll. 14-29, emphasis added.]

"Data mining systems, on the other hand, can build a set of high-level rules about a set of data, such as "If the purchaser is a student and between the ages of 16 and 21, then the probability of buying a compact disk is eighty percent." Such rules allow a manager to make queries, such as "Which customers have the highest probability of buying a compact disk?" This type of knowledge allows for targeted marketing of products and helps to guide other strategic business decisions." [p. 9, ll. 18-27, emphasis added.]

These passages show advantages to the use of data mining. For example, the rule building capability of the data mining systems have the advantage of allowing more abstract queries to be formed, and which can be more easily answered by the vast amount of collected data using data mining than a manual search for such relationships. These capabilities are apparently not shown in the passages cited by the Examiner, and it is therefore respectfully asserted that the cited references do not teach all claimed limitations of the rejected claims.

Data mining is discussed elsewhere in the present application, and the difference between the cited references and the present application lies in the use of data mining as shown in these passages. The relevant claims of the present application, such as Claim 9 for example, claim, "employing data mining algorithms to generate input data for forming the set of spatial relationships." [Emphasis added.] Thus data mining is used along with spatial analysis to generate the set of spatial relationships. The application discusses this innovative use of data mining with spatial analysis at page 21, lines 23-32:

As noted above, retail establishments desire a form of data analysis that discovers relationships between product placement and the choice of product purchases by a customer. By taking advantage of the realization that the many databases owned by a retail establishment contain spatial information, the present invention integrates spatial analysis methodologies with data mining methodologies. This integration of methodologies helps solve the problem of understanding a customer's buying habits in a retail establishment. [Emphasis added.]

This passage notes that the present application does not merely teach the idea of data mining in a retail analysis, but integrates data mining with other techniques to gather

information that is not ascertainable otherwise. A relevant part of the discussion from the present application continues at page 23, line 7 through page 24, line 21:

> Discovery-based data mining allows for the understanding of the customer and the products that the customer may buy together. As noted above in the description of general data mining techniques, data mining alone may provide interesting relationships. For example, data mining within the purchase transactions of a retailer may reveal a rule such as middle-aged men tend to buy at least two dessert items when they make a food purchase at a particular grocery store between 6 p.m. and 10 p.m. However, a grocery store may have dessert items placed at several locations throughout its retail space, and data mining alone cannot provide further information concerning relationships between the locations of the purchased dessert items. For example, a grocery store may have dessert items located in a freezer section, a dairy section, a bakery section, and a candy confection section, and the grocery store operator may be interested to know that the dessert items which tend to be purchased together do not lie within thirty feet of each other, i.e. middle-aged men seem to make an extra effort to walk between these sections looking for particular items.
>
> **Spatial analysis using GIS utilizing the data collected by the data collection devices GPS, LPS, and EGPS integrated with the product/customer relationships discovered using data mining allows for the relationship of these products in the retail environment to be monitored and analyzed, which allows for the proper evaluation of related product purchases by certain customers and how their position in the store may influence those purchases.** Continuing with the above example, spatial analysis of the customer paths and item location determines the exact locations of the dessert items within the retail space, their relative placement to one another, and the movement of customers throughout a retail space in relation to these products. The interaction and selection of products by customers may be spatially analyzed using analyses such as "what-if" concerning another position in the store to determine if an alternative spatial relationship of products might be more profitable. These spatial relationships may be integrated with the data relationships discovered through data mining to determine additional information concerning purchases by customers. This knowledge then provides the retail establishment with the direction necessary to enhance such purchases through the co-location of products that appear in the same shopping baskets consistently. [Emphasis added.]

As the above passages describe, data mining is used in conjunction with spatial analysis techniques to discover additional information concerning the retail environment, for example. The present application describes a two step approach, using data mining

first to generate a set of information or data, then using spatial analysis on that data to form a set of spatial relationships.

This distinction is demonstrated in the claims of the present application. Claim 9 claims the feature of, "employing data mining algorithms to generate input for forming the set of spatial relationships," while claim 10 further claims, "employing spatial analysis algorithms to form the set of spatial relationships." Hence, the idea of the present application includes using data mining "to generate input" for forming the relationships, and using spatial analysis algorithms "to form the set of spatial relationships."

This use of data mining as recited in the claims is not taught nor suggested in the cited reference, which only mentions data mining in the broadest of terms. For example, the cited reference Hughes mentions data mining at col. 17, line 7.

> <u>The Analyst tool offers users a variety of advanced data visualization, decision making and mining tools for measuring and analyzing overall facility performance</u>. It allows a manager to quickly see which parts, for example, in retail, which departments of a store are performing well and which are not with respect to a variety of performance measures. These measures could include total profit, profit per area, and so on. The analyst tool also offers users a variety of advanced data visualization, decision making, and <u>mining tools</u> for measuring and analyzing micro-level data, for example, SKU (stock keeping units), colors, patterns, and styles and for analyzing overall enterprise performance. It allows a centralized manager to quickly see how stores are performing within a particular region." [Col. 17, ll. 6-19.] [Emphasis added.]

This passage does not appear to teach the combined use of data mining and spatial analysis tools as described in the present application and as claimed. Applicant finds no mention of using data mining <u>for generating input for forming the set of spatial relationships</u>. If Applicant has overlooked a relevant teaching, it is respectfully requested that such teaching be pointed out with particularity.

To further distinguish the cited references, it is noted that data mining could be employed in a number of ways that are distinct from the use as claimed in the present application. For example, Hughes could employ data mining merely to collect and sort information gathered from transponders, or to associate that information with other sets of information such as time of purchases, number of purchases, etc. The potential uses of data mining are many. The present application does not claim all uses of data mining in

the retail context, only the specific uses of data mining as claimed in Claim 9, for example.

Hughes' description of data mining is limited to only a brief reference that data mining can be employed (as noted above in the reproduced passages from Hughes), and it is therefore respectfully asserted that Hughes does not teach the more specific implementation for data mining which is claimed in the present application, in at least Claims 9 and 10.

The Examiner also cites Hughes at col. 20, lines 10-15 and 25-60 as teaching the feature of employing data mining to, "generate input data for forming the set of spatial relationships," as claimed in Claim 9. However, these passages do not appear to mention data mining, and their implementation does not appear to depend on data mining. For example, col. 20 lines 11-15 state:

> In another application the system provides a method for calculating traffic around a facility/store. For example, in retail, as customer paths are mapped this data can be used to evaluate the high and low traffic areas in the store.

Applicant respectfully asserts that this passage does not teach nor suggest the use of data mining to generate input data for forming the set of spatial relationships. Hughes also states at col. 20 lines 26-31:

> As indicated previously, values can be assigned to objects based on their location and space, for example, by cross relating object location data to traffic data. In this method, the top traffic zone would have a higher value assigned to it than the average traffic zone, which in turn would have a higher value than the low traffic zone.

Neither of the above recited passages teaches data mining as claimed in at least Claim 9. Though these passages do appear to depict mapping customer paths and cross relating object location data to traffic data, it is not stated nor suggested that data mining is used to supply input for forming a set of spatial relations.

Certainly Hughes must obtain input from some source in order to cross relate objects and customer paths, for example, but it is respectfully pointed out that data mining is not the only source of obtaining input information for forming spatial

relationships. Hughes appears to only use gross data as obtained directly from transponders to relate location and traffic, for example. Yet, as described above, the present specification recites several ways that data mining can be used to obtain abstract views of data that are not readily apparent from merely looking at aggregate data. It is respectfully asserted that using these abstract views of the data, as provided by data mining techniques, for input to form spatial relationships is patentably distinct from merely grouping object location data and customer path data, as is apparently taught by Hughes.

Since all independent claims of the present application (*i.e.*, claims 2, 9, 17, and 24) include a feature similar to that of Claim 9 argued above, it is urged that all independent claims of the present application are patentable over the cited references.

It is also respectfully urged that dependent claims are also therefore allowable over the cited references.

IV. Conclusion

It is respectfully urged that the subject application is patentable over Hughes, and over Hughes in view of Abell, and is now in condition for allowance.

The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

DATE: 9/16/02

Respectfully submitted,

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